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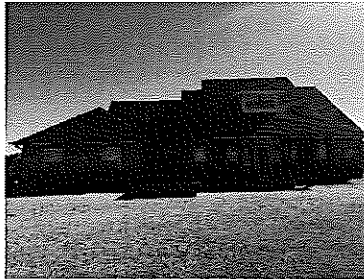
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REPORT OF FINDINGS

Claim No: 36-13Z0-28D

Date of Loss: 08/31/20

**INSURED: DONALD LEJEUNE
327 NORTHWEST 12TH AVENUE
NORMAN, OKLAHOMA 73072**



Prepared for:

**STATE FARM INSURANCE COMPANY
P.O. BOX 106169
ATLANTA, GEORGIA 30348**



Date:
Ryan L. 2021.03.16
Logan 14:47:57
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This report has been electronically signed and sealed by Ryan L. Logan, P.E., on March 16, 2021 using a Digital Signature. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Ryan L. Logan, P.E.
Oklahoma Professional Engineer
License No. 24313

March 16, 2021



ProNet File No: 47355
SFF&CC/Lejeune 00274



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I. INTRODUCTION

On February 2, 2021, Mr. David Camp with State Farm Insurance Company retained ProNet Group, Inc. to inspect the Lejeune residence, located at 327 Northwest 12th Avenue in Norman, Oklahoma.

The purpose of our evaluation was to determine the reported damage to the roof covering of the residence.

II. BASIS OF REPORT

This report is based on the following:

- Interview with the homeowner, Mr. Donald Lejeune.
- Inspection of the roof and exterior of the residence and reported damaged areas in particular.
- Pertinent dimensions and photographs of the residence in general and damage in particular.
- Review of pertinent weather data provided by the National Oceanic and Atmospheric Administration (NOAA) and National Centers for Environmental Information (NCEI) websites for the locality during the period surrounding the reported date of damage.
- Review of ASCE standard ASCE 7-10 titled "*Minimum Design Loads for Buildings and Other Structures*."



- Review of the article titled "*Hail Damage to Asphalt Roof Shingles*", located online at www.ams.confex/ams/pdfpapers/81091.pdf, and written by Timothy P. Marshall, Richard F. Herzog, and Scott J. Morrison.
- Review of the article titled "*Hail: Sizing It Up!*" located online at <http://jdkoontz.com/articles/hailsize.pdf>, written by Vickie Crenshaw and Jim D. Koontz.

This report was prepared for the exclusive use of State Farm Insurance Company and was not intended for any other purpose. ProNet Group, Inc. assumes no responsibility whatsoever for the unauthorized use of this report by a third party. This report is based on information available to us at this time. Should additional information be presented or discovered, we reserve the right to review and, if necessary, revise this report and our conclusions in light of the new information.

III. PROPERTY DESCRIPTION

The structure is a two-story, single-family residence constructed of wood-framed exterior walls covered with wood siding and brick veneer and supported on a shallow foundation system with a concrete slab-on-grade. The structure has a gable and hip roof with a pitch of approximately 10/12 and covered with asphalt shingles. There is an attached garage on the left side of the structure, and a covered patio at the back side of the residence. The floor elevation of the residence is above street elevation, and surface drainage to the surrounding property provides the primary drainage for the property. For the purpose of this report, as a reference, the front of the structure faces primarily to the west.



IV. CONCLUSIONS

Based on our findings and observations as noted in this report, it is our technical opinion that:

- There is no damage to the asphalt shingles as the result of high wind from the reported storm event or any single weather event.
- The unbonded shingles at multiple locations on the roof resulted from long-term aging and weathering of the roof covering combined with wear and tear due to foot traffic and repairs over the years of service life and not a single weather event.
- The dents in the metal vent caps and flashing are cosmetic in nature as there was no evidence of penetrations through the metal (which would allow water to penetrate) nor damage that would affect the functionality or structural integrity of the components.
- There is no damage to the asphalt shingles as a result of hail impacts from the reported storm event, or any other single weather event.
- The scattered shingles with sporadic granular loss, exposed shingle fibers, and blisters throughout the roof slopes resulted from roof shingle anomalies, manufacturing deficiencies, mechanical damage, abrasions, age, foot traffic, and normal wear and tear of the shingles from exposure to the elements over the years and did not result from the reported or any single weather event.



V. DISCUSSION

INTERVIEW

The following information was obtained from Mr. Donald Lejeune regarding the history of the residence:

- The residence is approximately 14 years old, and he has owned the residence since it was built.
- The roof covering has never been replaced.
- There have been no roof leaks.
- About one and a half to two years ago, modifications were made to the residence:
 - Gutters and downspouts were replaced.
 - Roof vents on the east roof slope were removed and new asphalt shingles were installed in the area where the roof vents were removed.
 - Ridge vents were installed.
- Hail damage on the roof covering possibly resulted from a June 2020 storm.

INSPECTION

On February 22, 2021, Ryan L. Logan, P.E., with ProNet Group, Inc., in the presence of Mr. Donald Lejeune, inspected the roof and exterior of the residence. General dimensions and photographs were taken to document our observations. This report identifies representative conditions in and around the residence and reflects typical conditions observed during our inspection. All photographs are available for review and several are included in this report.



The following are some of the data and observations used for our technical evaluation of the structure:

Roof

- Roof is covered with approximately 4700-square-feet (SF) of asphalt composition shingles with a predominant slope of 10/12.
- Sporadic locations of blisters, granular loss, and exposed fibers on the shingles.
- Multiple locations of unbonded shingle corners in a diagonal stairstep pattern.
- Dents in the metal vent caps and flashing.
- No spatter marks on the shingles.
- Isolated locations of torn shingles.
- Isolated location of missing shingles near the ridge on the west roof slope.
- Numerous locations of nail pops.

Exterior

- Lack of evidence of damage to the soffits.
- No dents in the metal gutters.
- No damage to the metal light fixtures.
- No broken windows.
- No damage or spatter marks on the satellite dish.

WEATHER DATA

Weather records were researched for hail events recorded for McClain County with the Storm Events Database from the National Centers for Environmental Information website (<https://www.ncdc.noaa.gov/stormevents/>) for the time period of January 1, 2007 through December 31, 2020. The result of our research revealed 123 hail events. The closest of these to the Lejeune residence was approximately two miles northwest of the residence and reported a maximum hail size of 1.25-inch diameter on April 13, 2014.



Records were also researched for high wind events. The result our research revealed 61 high wind events in McClain County during this time period.

ANALYSIS

It has been our experience evaluating structures that have been exposed to high wind forces that related damage first occurs to gutters, downspouts, mounted satellite dishes, cladding, roof-mounted equipment, and non-impact resistant windows and doors before damage is observed to the roof coverings of the residence. No such corroborating damage was observed at the Lejeune residence.

It has also been our experience that with high wind forces passing over a roof, damage is first manifested in the form of displaced shingles along the ridge, hip, and particularly along the edges of gables. Inspection of the roof did not reveal evidence of displaced, dislodged, or wind-related damage along these critical locations (with the exception of one isolated location of missing shingles), which are areas that would experience the highest uplift forces compared with the field (middle section) of the slopes, as depicted in the American Society of Civil Engineers standard (ASCE-7).

Attempts were made to lift the edge of some of the shingles on all roof slopes at various locations, to determine if they were bonded to the shingle below. The shingles were generally well bonded to the shingles below. However, there were sporadic locations of unbonded shingle corners in a diagonal staircase pattern.

Partially and fully unbonded shingle ends commonly occur as asphalt shingles age. Once roof shingles are installed, the moisture and oils retained in the asphalt material begin to slowly dissipate from sun and heat exposure. As the weathering process continues, the shingles shrink causing tension forces within the shingles, particularly along the horizontal length of the shingle because it has the largest dimension and, therefore, experiences the greatest dimensional change. The wood substrate below the shingles also expands



and contracts during variations in humidity, which causes periodic tension forces in the overlying shingles as well.

The unbonded shingles were randomly located over all roof slopes. Typically, wind damage from a storm event will cause damage to one section or side of a roof slope, but not necessarily over all the roof slopes. Furthermore, the unbonded shingles exhibited no creases in the surface of the shingles, indicating they were not unbonded as a result of elevated wind force, which would have flipped the shingle and creased the topside. Our inspection of the roof slopes revealed no damage or pattern of damage that would indicate the roof shingles were damaged by excessive wind forces acting on the structure.

The site observations, data and analysis support our finding that there is no damage to the asphalt shingles as the result of high wind from the reported storm event or any single weather event. The unbonded shingles at multiple locations on the roof resulted from long-term aging and weathering of the roof covering combined with wear and tear due to foot traffic and repairs over the years of service life and not a single weather event.

Hailstones impacting onto asphalt shingle surfaces can cause damage to the shingles and underlayment, if they have sufficient size, hardness, impact velocity, and angle of impact. If hailstones have these physical characteristics, they may cause structural damage (felt damage and/or penetrations) to the shingle. Furthermore, hail with these same characteristics can also cause non-structural cosmetic marks (splash marks on the surfaces with minor displacement of granules, dirt, and/or mold/mildew). Minor granule loss (granules dislodged from the shingles to expose bitumen without shingle mat rupture) caused by a hailstone impact, has not been found to cause any measurable loss of service life for the impacted shingle, and is typically classified as cosmetic.

Inspection of the metal items on the roof of the residence revealed dents in the metal vent caps and flashing. Dents in the light-gauge metal roof vent caps and flashing at the



property indicate that hailstones have impacted the roof surfaces previously. However, because they are formed of unsupported light-gauge metal, it is common for metal roof vents to sustain cosmetic dents from hailstones of smaller size than that necessary to cause damage to the asphalt roof shingles.

The dents in the metal vent caps and flashing are cosmetic in nature as there was no evidence of penetrations through the metal (which would allow water to penetrate) nor damage that would affect the functionality or structural integrity of the components.

Close inspection of the roof shingles at the residence did not reveal any structural damage or any hail impact-related patterns on the shingle surfaces that would have damaged the shingles, felt material, or caused fractures or penetrations through the shingles.

Weather research for the time period of January 1, 2007 through December 31, 2020 revealed the closest hail event to the Lejeune residence occurred on April 13, 2014 was reported approximately two miles northwest of the residence with a maximum 1.25-inch-diameter hailstones.

On May 4, 2012, the Roofing Industry Committee on Weather Issues, Inc. (RICOWI) published a report titled "Hailstorm Investigation" on their website, based on the May 24, 2011 hailstorm event that resulted in three rounds of thunderstorms containing large hail and tornadoes which passed through portions of North Texas, including the Dallas/Fort Worth metropolitan area. After the weather event, a total of 63 asphalt or modified bitumen shingle roofs were inspected by RICOWI. They categorized the impact damage on a scale from 0 to 5 as follows:

- 0 – No apparent damage.
- 1 – Surface impact marks without fractures or punctures.
- 2 – Minimal damage (low severity and low quantity).
- 3 – Moderate amount of fractures, punctures, or spalling.



4 – Moderate/severe denting of metal roofing.

5 – Severe damage resulting in potential leakage.

The RICOWI investigation determined that hail pellet sizes ranging from 0.25 inches to 1.25 inches impacting asphalt shingle roofs, similar in shape, configuration and condition to the Lejeune residence's roof system, resulted in category 2 or lower damage, indicating those roofs had either no apparent damage or minimal damage without fractures or punctures in the roof shingles. The closest reported hailstorm to the Lejeune residence included maximum 1.25-inch-diameter hailstones, which are smaller than hailstones that capable of damaging laminate asphalt shingles.

Roof shingle damage can occur from natural deterioration, normal stresses, installation deficiencies, or environmental conditions. The roof becomes more susceptible to damage and subsequent moisture intrusion as roof coverings age. The high heat and high humidity in Oklahoma result in a considerably shorter service life for asphalt shingles than is generally expected in other areas of the country.

Inspection of the roof slopes revealed numerous roof shingles with granular loss, exposed shingle fibers, blisters, and roof shingles that are showing the effects of exposure to the environment and wear and tear over the years. Granular loss, exposed shingle fibers and blisters are commonly mistaken as hail damage. This is consistent with roof shingles showing the effects of aging and exposure to the environment over the years of service and not the result of the reported or any single weather event.

Granular loss is normal and should be expected from the moment shingles are manufactured, shipped, installed, and during the weathering process. Granules are part of the wearing surface of the shingle and therefore small quantities of granules are expected to be removed from the shingles during weather events over the useful life of the shingles; however, that condition does not adversely shorten the expected life of the shingles or adversely affect the water shedding ability of the shingles.



The scattered exposed shingle fibers are consistent with aging and wear and tear over the years from exposure to the environment. Mechanical damage (marring from foot traffic, shipping, maintenance, storage, fabrication, and/or knife slices from installation) and manufacturing deficiencies (where the granules did not adhere to the base coat and/or the base coat was too thin to bond to the granules) also contributed to the exposed shingle fibers.

Shingle blisters occur from a combination of poor-quality asphalt combined with heat. They appear as small bubbles in the shingle surfaces when trapped moisture within the asphalt base sheet expands as it is heated by the sun. As the asphalt covering is heated, the expanding moisture ruptures, and the overlying granules are displaced leaving small areas of missing granules with steep sides. These areas are distinguishable from hail impacts because they are typically smaller in size than the diameter of hailstones required to displace granules from asphalt shingles and have square vertical edges at the perimeter of the area of missing granules.

The site observations, data and analysis support our finding that there is no damage to the asphalt shingles as a result of hail impacts from the reported storm event, or any other single weather event. The scattered shingles with sporadic granular loss, exposed shingle fibers, and blisters throughout the roof slopes resulted from roof shingle anomalies, manufacturing deficiencies, mechanical damage, abrasions, age, foot traffic and normal wear and tear of the shingles from exposure to the elements over the years and did not result from the reported or any single weather event.

This report and the conclusions contained herein are for the express and sole use of the client requesting the report. This report is not to be relied upon nor used by any other person and/or entity for any purpose. The enclosed submitted observations, opinions and conclusions are based on scientific methods, visual inspection and observations, generally accepted engineering criteria and the professional knowledge and experience of the engineer in the forensic analysis of residential and commercial buildings and components.

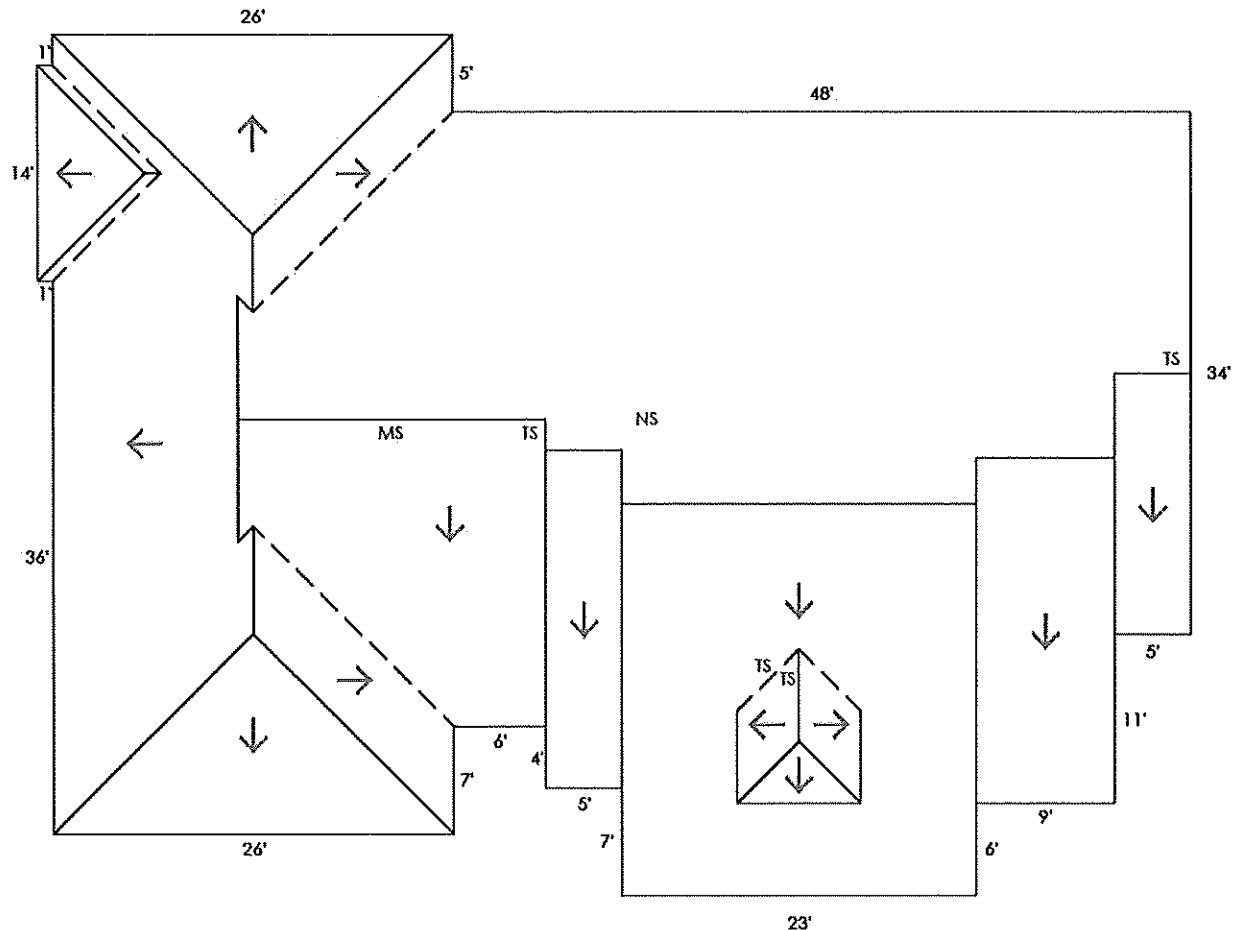


Such an inspection cannot detect all existing or potential adverse conditions and it should, therefore, be understood that future conditions affecting items discussed in this report cannot be predicted since they are all subject to change. ProNet Group, Inc., its affiliates, officers, agents, employees, and representatives shall not be liable to client or any third party for any loss, cost, damage, or expense (including attorneys' fees), whether indirect, incidental, consequential, special, or exemplary, incurred in connection with the client's use of this report. The scope of this report extends only to the express noted items. Further, this engineering report is not a warranty or guarantee, express or implied, of any kind.



VI. ATTACHMENTS

A. ROOF LAYOUT



FRONT

LEGEND

MS - MISSING SHINGLES

NS - AREA WITH NEWER SHINGLES

TS - TORN SHINGLE

NOTES

1. LOCATIONS/SIZES/DIMENSIONS ARE APPROXIMATE.
2. ROOF IS COVERED WITH APPROXIMATELY 4 700 SQUARE FEET OF ASPHALT SHINGLES.
3. TYPICAL ROOF SLOPE IS 10/12 UNLESS NOTED OTHERWISE.
4. MULTIPLE LOCATIONS OF UNBONDED SHINGLE CORNERS IN A DIAGONAL STAIRSTEP PATTERN.

ProNet Group, Inc. TOLL FREE 800-216-7268 • WWW.PRNETGROUP.COM		SITE VSB: 02/22/21 SCALE: N.T.S.	
ENGINEER: RYAN L. LOGAN P.E.		ROOF LAYOUT	FILE #: 47355
PROPERTY LOCATION: 327 NORTHWEST 12TH AVENUE - NORMAN, OKLAHOMA		SEE & C64-11000-00288	SHEET NO: 1 of 1

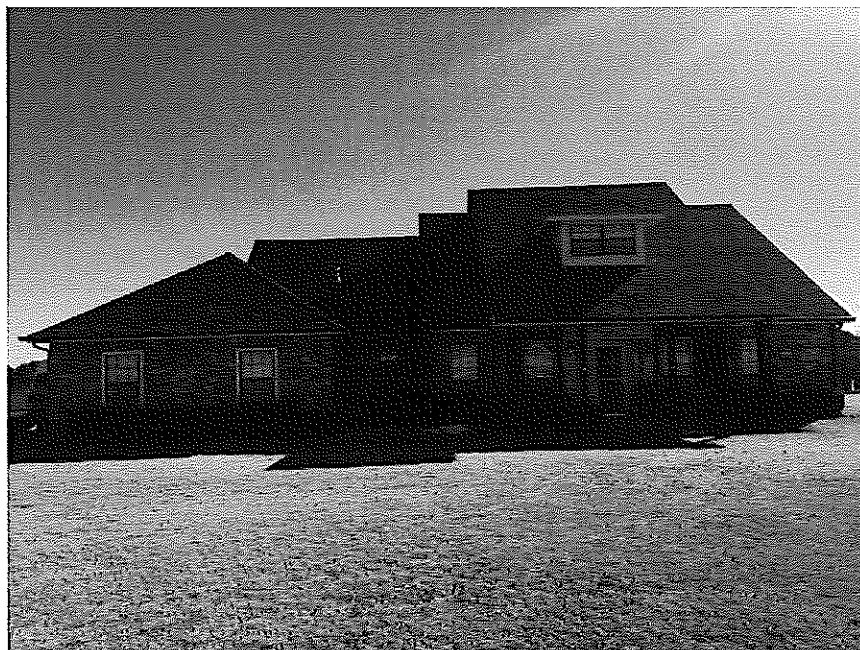


VI. ATTACHMENTS

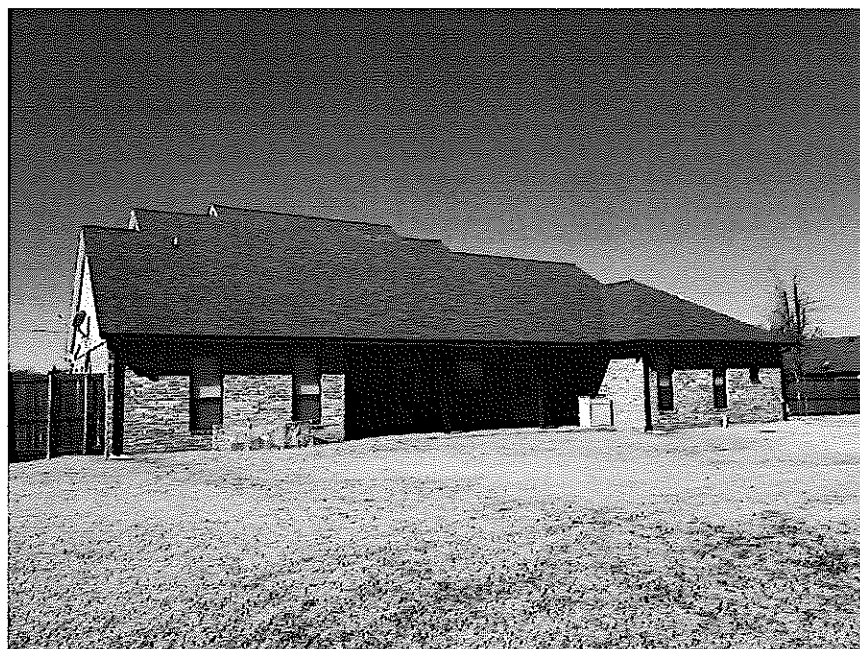
B. PHOTOGRAPHS



1. View of the front (west) of the Lejeune residence located at 327 Northwest 12th Avenue in Norman, Oklahoma.



2. View of the rear (east) of the residence.





3. View of the side (north) of the residence.



4. View of the side (south) of the residence.





5. View of the north roof slope.

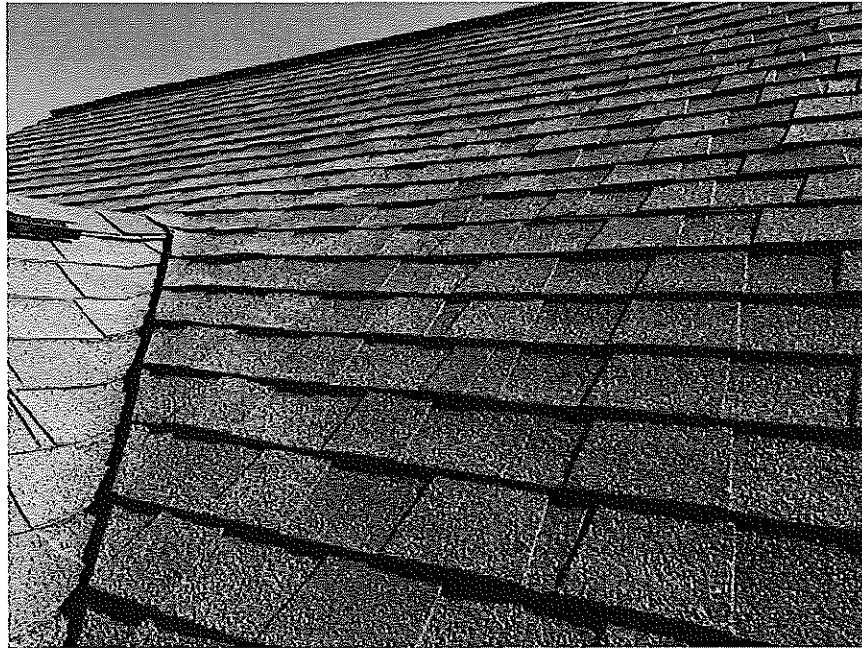


6. View of the east roof slope.

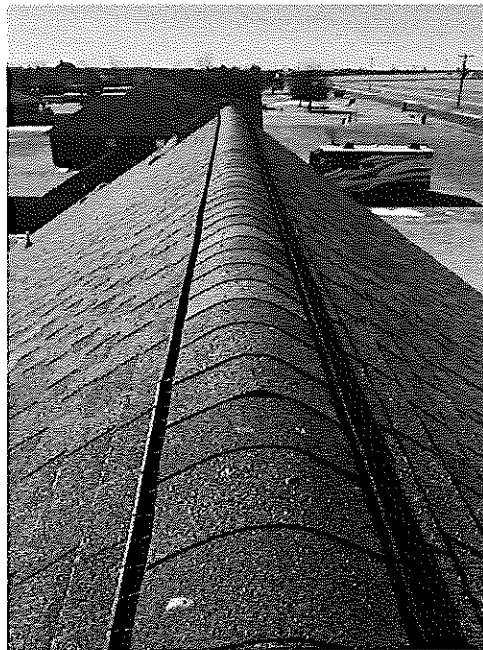




7. View of the west roof slope.

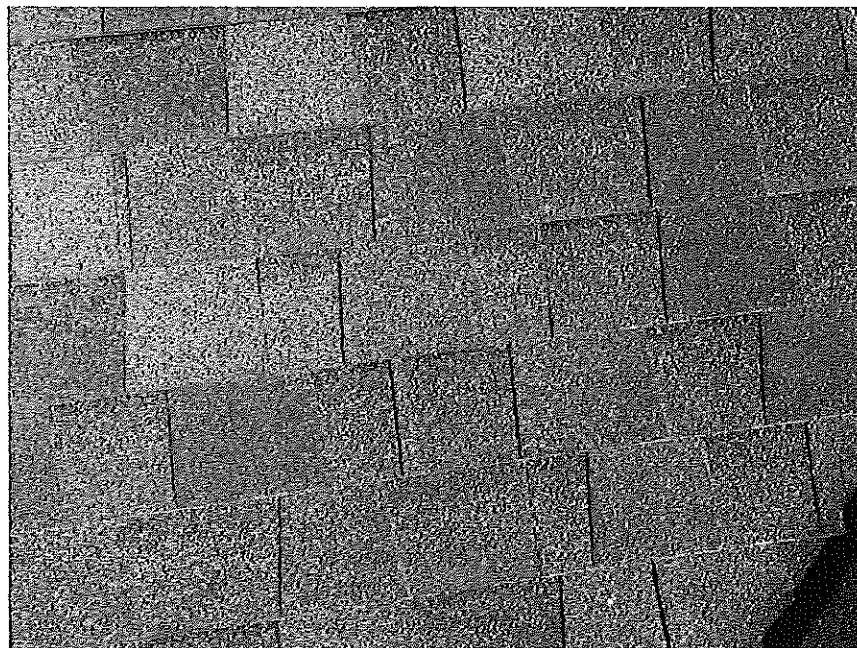


8. View of the roof high ridge.





9. View of typical shingles. Note the lack of spatter marks.

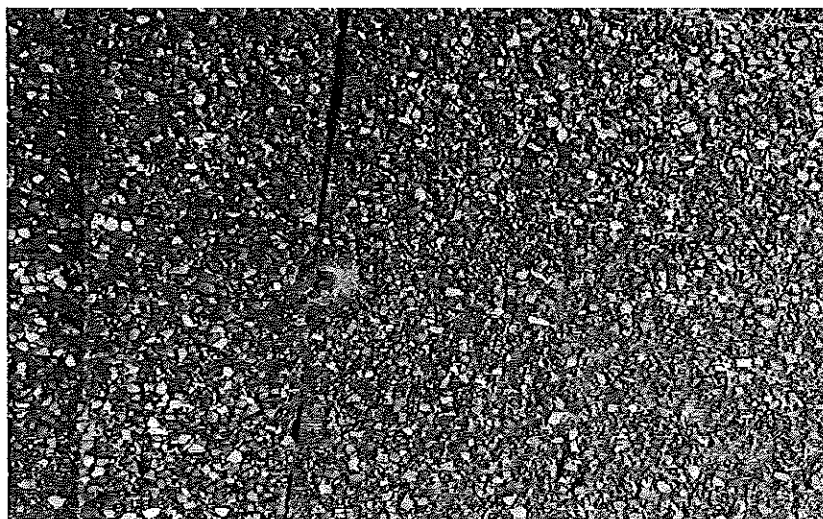


10. View of a typical blister on a shingle.

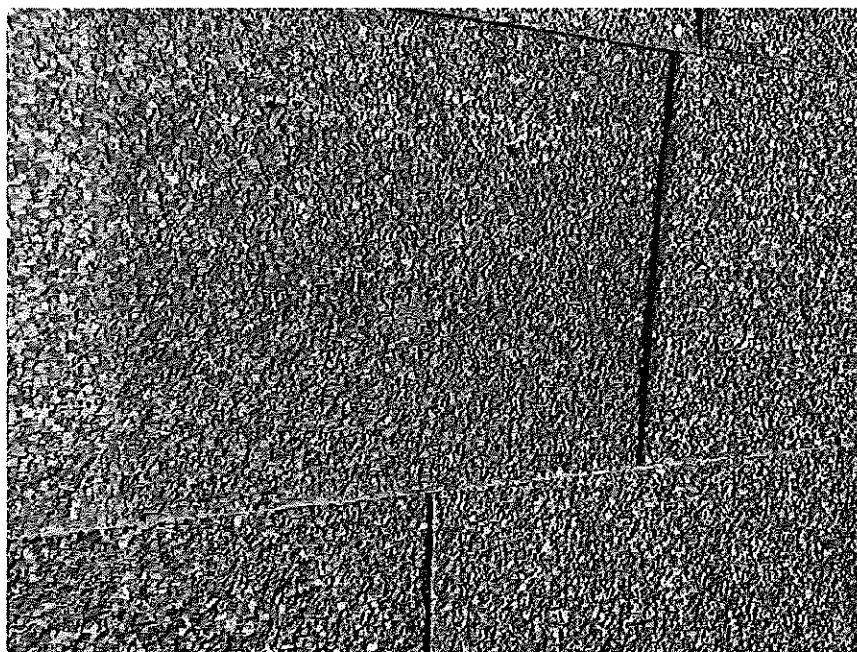




11. View of typical exposed fibers on a shingle.



12. View of typical granule loss on a shingle.





13. View of a typical nail pop.



14. View of an area of newer shingles where roof vents were reportedly located.

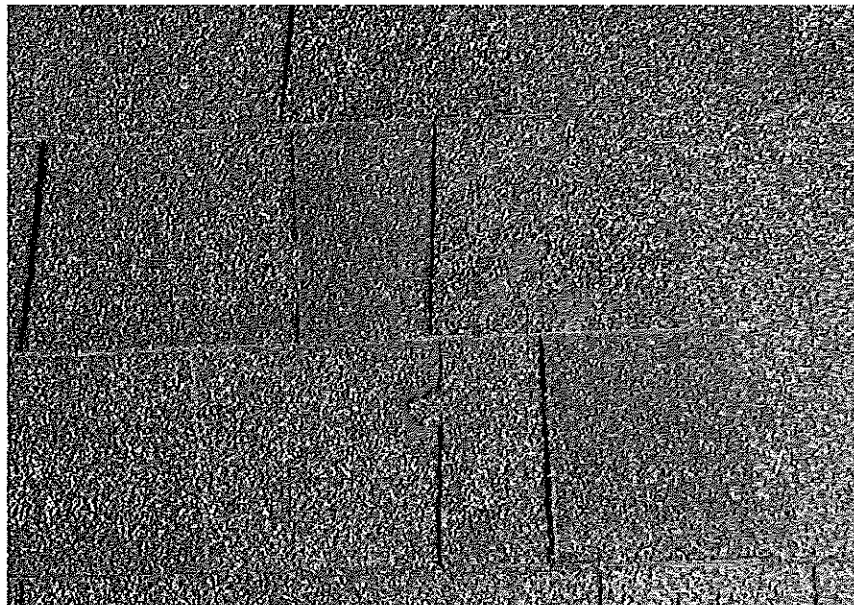




15. View of an isolated area of missing shingles near the ridge on the west roof slope.



16. View of an isolated torn shingle.





17. View of typical unbonded shingle corners in a diagonal, stair-stepped pattern.

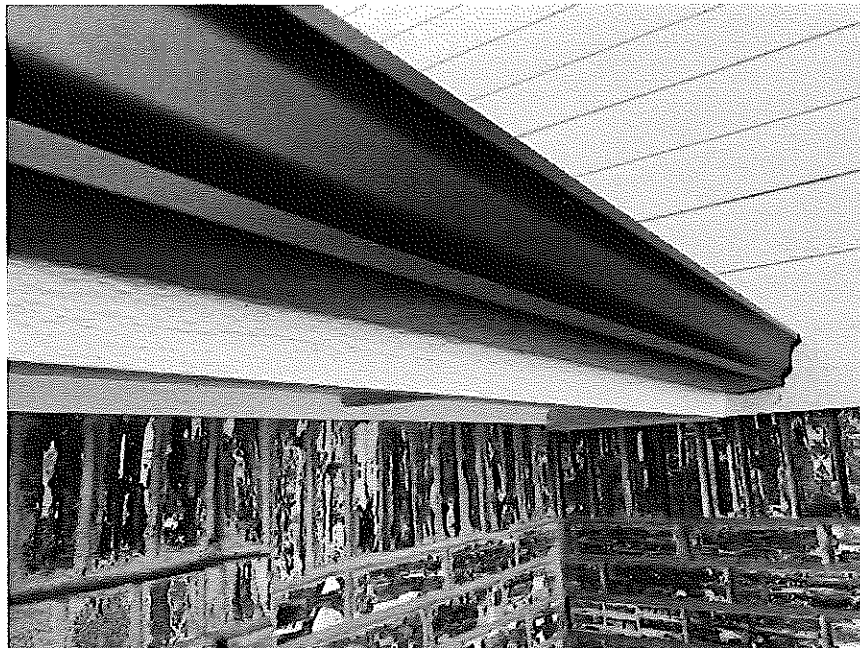


18. View of a typical dented metal vent cap.





19. View of a typical metal gutter. Note the lack of dents.



20. View of a typical metal downspout. Note the lack of dents.

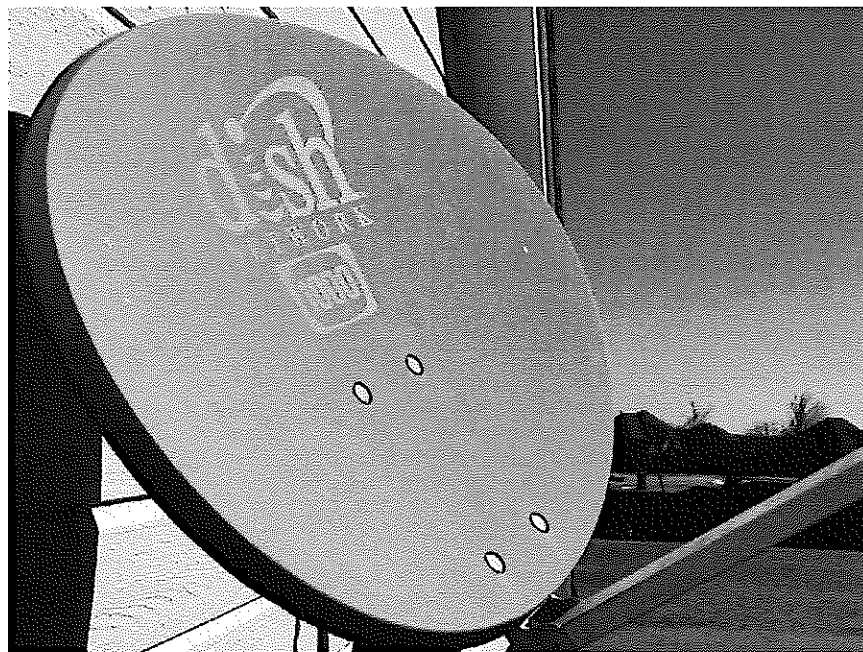




21. View of typical wood siding. Note the lack of evidence of hailstone impacts.

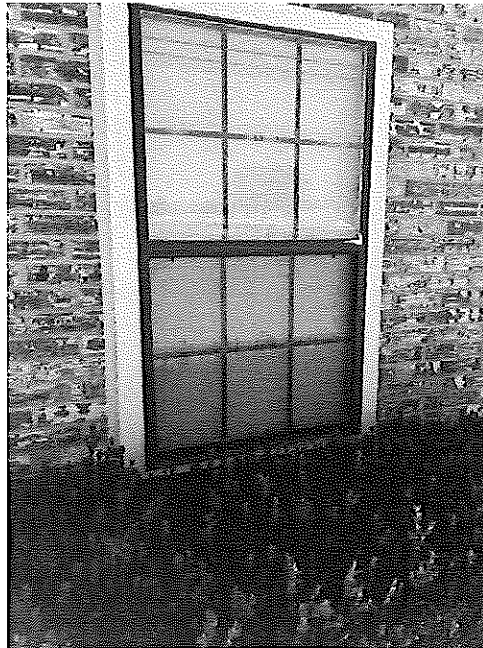


22. View of the satellite dish. Note the lack of spatter marks or damage.





23. View of a typical unbroken window.



24. View of a typical undamaged light fixture.





25. View of a typical soffit. Note the lack of evidence of damage.





VI. ATTACHMENTS

C. WEATHER RESEARCH